

Scheda di Allenamento: Le equazioni

Risoluzione di problemi con i monomi

1. Equazioni di primo grado: Fondamenti

Parte Base 1. Risolvi le seguenti equazioni di primo grado applicando i principi di equivalenza:

1. ■□□ $-x + 4 = 3$ [$x = 1$]
2. ■□□ $3 + x = -2$ [$x = -5$]
3. ■□□ $10 - x = -3$ [$x = 13$]
4. ■□□ $x + 1 = -18$ [$x = -19$]
5. ■□□ $12x + 2 = 8$ [$x = 1/2$]
6. ■□□ $4x - 2 = 2$ [$x = 1$]
7. ■□□ $5x - 3 = 7$ [$x = 2$]
8. ■□□ $-4x = -2 + 6$ [$x = -1$]
9. ■□□ $x + 5 = 9$ [$x = 4$]
10. ■□□ $-7 + x = 11$ [$x = 18$]
11. ■■□ $-x + 2 = 21$ [$x = -19$]
12. ■■□ $4x - 5 = -5$ [$x = 0$]
13. ■■□ $2x + 3 = 10$ [$x = 7/2$]
14. ■■□ $x - 1 = 2x + 2$ [$x = -3$]
15. ■■□ $5x + 6 = -9$ [$x = -3$]
16. ■■□ $10 + 5x = -2 + 2$ [$x = -2$]
17. ■■□ $9x - 1 = 0$ [$x = 1/9$]
18. ■■□ $2 - 4x = 5$ [$x = -3/4$]
19. ■■□ $0 = 2x - 2$ [$x = 1$]
20. ■■□ $x - 3 = 2x + 1$ [$x = -4$]

Parte Base 2.

21. ■□□ $13x - 9 = 12x + 1$ [$x = 10$]

22. ■□□ $-10x + 6 = -9x - 2$ $[x = 8]$
23. ■□□ $5x + 2 = 4x - 5$ $[x = -7]$
24. ■□□ $20x - 10 = 19x + 14$ $[x = 24]$
25. ■□□ $15x + 3 = 12x - 9$ $[x = -4]$
26. ■□□ $-7 - 4x = -3x - 3 - 4$ $[x = 0]$
27. ■□□ $12x + 3 = 9x - 9$ $[x = -4]$
28. ■□□ $-5 - 4x = -3x - 1 - 4$ $[x = 0]$
29. ■□□ $-13x - 9 = -14x + 10$ $[x = 19]$
30. ■□□ $-32x + 4 = -33x - 11$ $[x = -15]$
31. ■■□ $-2x + 5 = -3x + 2$ $[x = -3]$
32. ■■□ $-4x + 2 = -5x - 1$ $[x = -3]$
33. ■■□ $-10x = 2 - 11x$ $[x = 2]$
34. ■■□ $-5 + 14x = 15x$ $[x = -5]$
35. ■■□ $-4x + 3 = 11x - 2$ $[x = 1/3]$
36. ■■□ $9x - 6 = 5x - 20$ $[x = -7/2]$
37. ■■□ $2x + 3 = x + 4$ $[x = 1]$
38. ■■□ $x - 6 = 2x - 8$ $[x = 2]$
39. ■■□ $-8x + 8 = x - 1$ $[x = 1]$
40. ■■□ $20 - 3x = -4x - 1 - 6x$ $[x = -3]$

Parte Base 3.

41. ■■□ $2 \cdot [x - (3x + 1)] = 4$ $[x = -3/2]$
42. ■■□ $3 \cdot [2 - (x - 5)] = x + 1$ $[x = 5]$
43. ■■□ $10 - [3x - (x - 2)] = 4$ $[x = 2]$
44. ■■□ $[2 \cdot (x + 1) + 3] = 3 \cdot (x - 1)$ $[x = 8]$
45. ■■□ $2 \cdot [3x - (1 + x)] = 5x + 2$ $[x = -4]$
46. ■■□ $-(x - [2x - (1 - x)]) = 5$ $[x = 3]$
47. ■■□ $2 \cdot [x + 2 \cdot (x - 1)] = 14$ $[x = 3]$
48. ■■□ $3x - [2 \cdot (x - 1) + 5] = 0$ $[x = 3]$

49. ■■■□ $4 \cdot [x - (2x + 3)] = x - 2$ $[x = -2]$
50. ■■■□ $5 - [2x - (3 - x)] = 2$ $[x = 2]$
51. ■■■□ $2 \cdot [(x + 1) - (2x - 3)] = x$ $[x = 8/3]$
52. ■■■□ $3 \cdot [2x - (x + 4)] = 2 \cdot (x - 1)$ $[x = 10]$
53. ■■■□ $[4x - (x + 3)] - 2 = x$ $[x = 5/2]$
54. ■■■□ $2 \cdot [3 - (x - 1)] = 4 \cdot (x + 2)$ $[x = 0]$
55. ■■■□ $-(2x - [x - (1 - x)]) = x$ $[x = -1]$
56. ■■■□ $3 \cdot [x + 1 - (2x - 1)] = 0$ $[x = 2]$
57. ■■■□ $2 \cdot [x - 2 \cdot (x + 1)] = 4$ $[x = -4]$
58. ■■■□ $10 - 2 \cdot [x - (3x + 1)] = 0$ $[x = -3]$
59. ■■■□ $[(x + 3) \cdot 2 - (x - 1)] = 5$ $[x = -2]$
60. ■■■□ $2 \cdot [x - (2x - 5)] = 3 \cdot (x + 1) + 1$ $[x = 6/5]$

2. Equazioni a coefficienti frazionari

Parte Base 4. Risolvi le seguenti equazioni a coefficienti frazionari (livello base):

61. ■□□ $\frac{1}{2}x = 4$ $[x = 8]$
62. ■□□ $\frac{3}{4}x = 6$ $[x = 8]$
63. ■□□ $\frac{x}{3} + 1 = 3$ $[x = 6]$
64. ■□□ $x - \frac{1}{4} = \frac{3}{4}$ $[x = 1]$
65. ■□□ $\frac{2}{5}x + \frac{1}{5} = 1$ $[x = 2]$
66. ■□□ $\frac{x}{2} + \frac{x}{3} = 5$ $[x = 6]$
67. ■□□ $\frac{x-1}{2} = 4$ $[x = 9]$
68. ■□□ $\frac{3}{2}x - 1 = \frac{1}{2}x + 3$ $[x = 4]$
69. ■□□ $x + \frac{2}{3} = \frac{1}{3}x + 2$ $[x = 2]$
70. ■□□ $\frac{x}{4} - \frac{1}{2} = 0$ $[x = 2]$
71. ■■■□ $\frac{2}{3}x + \frac{1}{6} = \frac{1}{2}$ $[x = 1/2]$
72. ■■■□ $\frac{x+2}{3} = \frac{x-1}{2}$ $[x = 7]$
73. ■■■□ $2x - \frac{3}{4} = \frac{1}{4}x + 1$ $[x = 1]$

74. ■■■□ $\frac{3}{5}x = \frac{9}{10}$ [$x = 3/2$]
75. ■■■□ $\frac{x}{2} + 1 = \frac{x}{4} + 2$ [$x = 4$]
76. ■■■□ $\frac{1}{3}(x - 1) = 2$ [$x = 7$]
77. ■■■□ $\frac{x}{5} - \frac{x}{10} = 1$ [$x = 10$]
78. ■■■□ $x - \frac{x}{2} = 3$ [$x = 6$]
79. ■■■□ $\frac{3x+1}{2} = 5$ [$x = 3$]
80. ■■■□ $\frac{2}{3}x - \frac{1}{3} = x - 1$ [$x = 2$]

Parte Base 5.

81. ■■■□ $\frac{1}{2} [x - 3(x - \frac{1}{2})] = \frac{1}{4}$ [$x = 1/2$]
82. ■■■□ $x - [\frac{1}{2}(x + 1) - \frac{1}{3}] = \frac{1}{6}$ [$x = 2/3$]
83. ■■■□ $2 \cdot [\frac{x}{3} - (1 - \frac{x}{2})] = \frac{1}{3}$ [$x = 7/5$]
84. ■■■□ $\frac{3}{4} [2x - (x - 1)] = \frac{1}{2}x + 1$ [$x = 1$]
85. ■■■□ $[\frac{1}{2}(x - 2) + \frac{1}{3}(x + 3)] = 1$ [$x = 12/5$]
86. ■■■□ $1 - [x - \frac{1}{2}(x - 1)] = \frac{x}{2}$ [$x = 1/2$]
87. ■■■□ $3 \cdot [\frac{2}{3}x - (\frac{x}{2} + 1)] = \frac{x}{2}$ [$x = 6$]
88. ■■■□ $\frac{x}{2} - [\frac{3}{4}x - (1 - \frac{x}{4})] = 0$ [$x = 2$]
89. ■■■□ $2x - [\frac{1}{3}(x + 1) + \frac{2}{3}] = x + 1$ [$x = 2$]
90. ■■■□ $\frac{1}{5} [2(x - 1) - (x - 2)] = \frac{x}{10}$ [$x = 0$]
91. ■■■□ $\frac{2}{3} [3x - (\frac{3}{2}x + 1)] = x - 1$ [$x = 1/3$]
92. ■■■□ $[\frac{x-1}{2} - \frac{x-2}{3}] = \frac{x}{6}$ [impossibile]
93. ■■■□ $2 - [\frac{1}{2}x - (\frac{1}{4}x + 1)] = \frac{3}{4}x$ [$x = 3$]
94. ■■■□ $\frac{3}{2} [x - \frac{1}{3}(x + 1)] = x + \frac{1}{2}$ [indeterminata]
95. ■■■□ $[1 - \frac{1}{2}(x + 2)] + \frac{3}{2}x = x$ [indeterminata]
96. ■■■□ $\frac{1}{4} [x - 2(x - 3)] = \frac{1}{2} - \frac{x}{4}$ [$x = 4$]
97. ■■■□ $x - [\frac{2}{3}x - (\frac{1}{3}x + 1)] = 2$ [$x = 1$]
98. ■■■□ $3 \cdot [\frac{x}{2} - (\frac{x}{4} + 1)] = \frac{x}{4} - 1$ [$x = 4$]
99. ■■■□ $\frac{1}{3} [2x - (x + 2)] = \frac{x-2}{3}$ [indeterminata]
100. ■■■□ $2 \cdot [\frac{1}{4}(x + 1) - \frac{1}{2}] = x - 1$ [$x = 1$]

3. Riepilogo: Equazioni di primo grado

Parte Base 6. Risolvi le seguenti equazioni di riepilogo, indicando se sono determinate, indeterminate o impossibili:

101. ■□□ $\frac{x+1}{2} - 3 = \frac{2}{3}x - 1$ [$x = -9$]
102. ■□□ $\frac{5-x}{3} + \frac{1}{2} = \frac{x+1}{2}$ [$x = 2$]
103. ■□□ $2x + \frac{1}{2} = \frac{2x+1}{2}$ [indeterminata]
104. ■□□ $\frac{x-1}{2} = \frac{x+1}{2} - 1$ [indeterminata]
105. ■□□ $3x - \frac{1}{3} = \frac{2x+1}{2} - 1$ [$x = 1/12$]
106. ■□□ $-\frac{1}{2} + \frac{x}{4} = \frac{5}{2} + x$ [$x = -4$]
107. ■□□ $\frac{1}{4}x + \frac{1}{2} = \frac{x+1}{2}$ [$x = 0$]
108. ■□□ $\frac{5x}{2} + \frac{3}{4} = \frac{x+2}{3}$ [$x = -1/26$]
109. ■□□ $2x + \frac{4}{3}x = \frac{1}{3}x - 1$ [$x = -1/3$]
110. ■□□ $\frac{x}{2} + \frac{3}{2} = x + \frac{2}{3}$ [$x = 5/3$]
111. ■■□ $\frac{2}{3}x + 1 = \frac{3}{2} + x - \frac{1}{3}$ [$x = 1/2$]
112. ■■□ $2x - \frac{1}{3} = \frac{1}{3} - \frac{1}{2}x - \frac{2}{3}$ [$x = 0$]
113. ■■□ $\frac{x-3}{2} + \frac{2x-1}{3} = \frac{1}{2}x + \frac{13}{6}$ [$x = 6$]
114. ■■□ $\frac{x-2}{2} + \frac{3}{4} = \frac{x-2}{2} + \frac{7}{4}$ [impossibile]
115. ■■□ $3(x + \frac{3}{4}) - 2 = \frac{32}{11}x$ [$x = 11/4$]
116. ■■□ $\frac{7}{2}x - \frac{1}{3} = x + 5 + \frac{5}{2}x$ [impossibile]
117. ■■□ $\frac{1}{5}x - 2(x + \frac{1}{2}) = -\frac{3}{2}x + \frac{2}{5}$ [$x = 5/4$]
118. ■■□ $\frac{3x}{5} + \frac{4-x}{15} + \frac{1}{3} = \frac{2(x-4)}{5} + \frac{x}{5}$ [$x = 33$]
119. ■■□ $\frac{2x-3}{5} + \frac{1-x}{3} = \frac{5+x}{5} - \frac{1}{15}$ [$x = -9$]
120. ■■□ $\frac{x}{2} - \frac{4-x}{4} = -1 - 2x$ [$x = 0$]
121. ■■□ $\frac{7-x}{3} + \frac{8-x}{2} = \frac{5-x}{6} - \frac{x}{6}$ [$x = 11$]
122. ■■□ $\frac{2+x}{3} - \frac{1-x}{2} = \frac{-5-x}{3} - \frac{1}{2}$ [$x = -2$]
123. ■■□ $\frac{3+x}{2} - \frac{2-x}{4} = \frac{2x-3}{5}$ [$x = -6$]
124. ■■□ $\frac{2}{3}x - \frac{x+2}{4} = \frac{1}{12}x - \frac{2x-3}{6}$ [$x = 3/2$]
125. ■■□ $\frac{1-3x}{6} - \frac{-x+1}{3} + 2 = \frac{4-3x}{6} - 3$ [$x = 17/8$]

126. ■■■□ $\frac{2-x}{3} - \frac{5-12x}{12} + \frac{x}{3} = 1 - \frac{x}{2} + \frac{-2-x}{4}$ $[x = 1/3]$
127. ■■■□ $\frac{4+x}{2} - \frac{5-x}{3} = \frac{2}{3} - \frac{x-1}{5} - \frac{1}{5}$ $[x = 130]$
128. ■■■□ $\frac{3x-1}{2} - \frac{5}{6} = \frac{5x-2}{12} + \frac{8x-1}{4} - \frac{3}{4}$ $[x = 2/11]$
129. ■■■□ $\frac{x-8}{2} - 1 - \frac{x+8}{3} = -1 + \frac{2x-1}{6}$ $[x = -39]$
130. ■■■□ $\frac{1+2x}{4} + \frac{-x+1}{3} = \frac{11}{20} - \frac{3+x}{5} + \frac{x}{20}$ $[x = -2]$
131. ■■■□ $\frac{-1-3x}{5} - \frac{x+1}{2} + 2x = \frac{x}{2} - \frac{x-3}{10}$ $[x = 2]$
132. ■■■□ $\frac{2-5x}{3} + \frac{13}{12} - \frac{x+2}{4} = \frac{x-4}{3} + \frac{2x-1}{3}$ $[x = 1]$
133. ■■■□ $\frac{2x-3}{4} + \frac{1}{8} - \frac{x-2}{8} = \frac{x-5}{8} + \frac{2x+3}{4}$ $[x = -2]$
134. ■■■□ $\frac{x-2}{3} - \frac{x+1}{6} - \frac{x+2}{2} = 1 + 2x + \frac{1}{2}x$ $[x = -1]$
135. ■■■□ $\frac{x+2}{4} - \frac{5(1-x)}{2} = -\frac{1}{4} + \frac{x+1}{2}$ $[x = 1]$
136. ■■■□ $\frac{x-2}{3} - \frac{3(-x+2)}{4} = \frac{3}{2}x - \frac{1}{6}x - \frac{1}{6}$ $[x = -8]$
137. ■■■□ $\frac{5-x}{2} + \frac{1}{2} + \frac{x}{2} = \frac{x-3}{2} - \frac{2(x+1)}{3}$ $[x = -31]$
138. ■■■□ $\frac{-x+3}{2} + \frac{1}{4}x - \frac{3-x}{2} = \frac{3(1-x)}{2} + \frac{1}{2}x$ $[x = 6/5]$
139. ■■■□ $\frac{2}{7} - \frac{4x+1}{21} + \frac{4x}{3} = \frac{2(x-3)}{7} + \frac{5}{21}$ $[x = -1]$
140. ■■■□ $3 + \frac{x+1}{2} - \frac{x-1}{2} = \frac{-x+1}{2} + \frac{12}{4} + \frac{x+1}{2}$ [indeterminata]
141. ■■■□ $\frac{x-2}{3} + \frac{1}{2}x - \frac{2(x-1)}{5} = \frac{x-3}{2} + \frac{1}{10} + \frac{x}{2}$ $[x = 2]$
142. ■■■□ $-3(x-2) + \frac{1}{2}x - \frac{2(x-5)}{4} = \frac{x-2}{2} + \frac{5}{4}x$ $[x = 2]$
143. ■■■□ $\frac{1}{2}x - \frac{2(x-1)}{7} + 2x = \frac{5}{7}x + 1 - \frac{x-3}{14} + \frac{9}{14}x$ $[x = 1]$
144. ■■■□ $\frac{-2x-1}{3} + \frac{2(x-2)}{5} + \frac{4x+2}{6} = \frac{x+1}{2}$ $[x = -13]$
145. ■■■□ $\frac{2}{3}x - \frac{4}{15} + \frac{-3(x+1)}{5} = \frac{2x-3}{6} + \frac{1}{10}x$ $[x = -1]$
146. ■■■□ $\frac{x-2x}{10} - \frac{7}{5} = \frac{-3(3x-2)}{2} - \frac{2(x-1)}{5}$ $[x = 1]$
147. ■■■□ $\frac{2(x+1)}{2} - \frac{(x-2)}{3} = \frac{-2(x-1)}{6} + \frac{1}{3}$ $[x = -1]$
148. ■■■□ $-\frac{x-4}{20} + \frac{5x-1}{10} = \frac{x}{5} + \frac{1}{2} - \frac{2(2x-2)}{5}$ $[x = 8/7]$
149. ■■■□ $\frac{2(x-2)}{3} - \frac{3(x-4)}{2} + \frac{1}{2}x = \frac{3}{4}x + \frac{1}{3}$ $[x = 4]$
150. ■■■□ $\frac{2(x+5)}{2} - \frac{2x-6}{3} = \frac{2x+10}{2} - \frac{2(x-3)}{3}$ [indeterminata]
151. ■■■□ $\frac{2(x-2)}{5} - \frac{1}{2}x + \frac{3}{4}x = \frac{3(1+x)}{10} - \frac{1}{20}$ $[x = 3]$

152. ■■■□ $\frac{2x-3}{6} + \frac{3(x-1)}{4} - \frac{2(3-x)}{6} = \frac{7}{12}$ $[x = 2]$
153. ■■■□ $\frac{1}{2}x + \frac{3(x-2)}{4} = \frac{2(2-x)}{3} - \frac{5}{4} + \frac{x+1}{6}$ $[x = 1]$
154. ■■■□ $\frac{x-3}{4} - \frac{x-1}{2} = \frac{3(x-1)}{4} + \frac{3}{2} + \frac{2(x+1)}{2}$ $[x = -1]$
155. ■■■□ $\frac{3(x-2)}{4} + \frac{1}{2}x - x = \frac{-2(x+3)}{3} + \frac{x-1}{2} + \frac{1}{6}$ $[x = -2]$
156. ■■■□ $\frac{3(x+6)}{8} - \frac{3(-x+3)}{4} = \frac{3(2x+5)}{8} - \frac{2(5x-1)}{4}$ $[x = 19/23]$
157. ■■■□ $\frac{2x-3}{7} - \frac{5x+6}{2} = \frac{-3(-2x+4)}{14} - \frac{x-1}{7} - \frac{3}{14}$ $[x = -1]$
158. ■■■□ $\frac{-3(x+1)}{4} - \frac{-2(x+1)}{3} = \frac{-3(x-2)-x+2}{12}$ $[x = 3]$
159. ■■■□ $\frac{-8+16x}{6} + \frac{-8x+4}{3} = \frac{8(-1+2x)}{6} + \frac{4(-2x+1)}{3}$ [indeterminata]
160. ■■■□ $2\left(\frac{2x-1}{3} + \frac{x-2}{2}\right) + \frac{1}{3}x = -\frac{1}{2}x + \frac{1}{3} + \frac{1}{6}x$ $[x = 1]$
161. ■■■□ $\frac{x-2}{3} - \frac{3(-x+2)}{4} = \frac{3}{2}x - \frac{1}{6}x - \frac{1}{6}$ $[x = -8]$
162. ■■■□ $\frac{5-x}{2} + \frac{1}{2} + \frac{x}{2} = \frac{x-3}{2} - \frac{2(x+1)}{3}$ $[x = -31]$
163. ■■■□ $\frac{-x+3}{2} + \frac{1}{4}x - \frac{3-x}{2} = \frac{3(1-x)}{2} + \frac{1}{2}x$ $[x = 6/5]$
164. ■■■□ $\frac{2}{7} - \frac{4x+1}{21} + \frac{4x}{3} = \frac{2(x-3)}{7} + \frac{5}{21}$ $[x = -1]$
165. ■■■□ $\frac{2x-3+x-1}{2} - \frac{2x-1}{3} = \frac{5(x+4)}{6}$ [impossibile]
166. ■■■□ $\frac{3(-x+2)}{5} + \frac{1}{2}x + \frac{x-4}{10} = \frac{x-2}{2} - \frac{3(-x+2)}{10}$ $[x = 3]$
167. ■■■□ $3 + \frac{x+1}{2} - \frac{x-1}{2} = \frac{-x+1}{2} + \frac{12}{4} + \frac{x+1}{2}$ [indeterminata]
168. ■■■□ $\frac{2x-3}{4} - \frac{2(x-3)}{3} + \frac{2}{3}x = \frac{x-2}{6} - \frac{1}{12}$ $[x = -5]$
169. ■■■□ $\frac{2}{5}x + 1 - \frac{3-x}{2} = \frac{-3(x-1)}{2} + \frac{3}{2}x + \frac{7}{10}$ $[x = 3]$
170. ■■■□ $\frac{x-2}{3} + \frac{1}{2}x - \frac{2(x-1)}{5} = \frac{x-3}{2} + \frac{1}{10} + \frac{x}{2}$ $[x = 2]$
171. ■■■□ $-3(x-2) + \frac{1}{2}x - \frac{2(x-5)}{4} = \frac{x-2}{2} + \frac{5}{4}x$ $[x = 2]$
172. ■■■□ $\frac{1}{2}x - \frac{2(x-1)}{7} + 2x = \frac{5}{7}x + 1 - \frac{x-3}{14} + \frac{9}{14}x$ $[x = 1]$
173. ■■■□ $\frac{-2x-1}{3} + \frac{2(x-2)}{5} + \frac{4x+2}{6} = \frac{x+1}{2}$ $[x = -13]$
174. ■■■□ $\frac{2}{3}x - \frac{4}{15} + \frac{-3(x+1)}{5} = \frac{2x-3}{6} + \frac{1}{10}x$ $[x = -1]$
175. ■■■□ $\frac{x-2x}{10} - \frac{7}{5} = \frac{-3(3x-2)}{2} - \frac{2(x-1)}{5}$ $[x = 1]$
176. ■■■□ $\frac{2(x+1)}{2} - \frac{(x-2)}{3} = \frac{-2(x-1)}{6} + \frac{1}{3}$ $[x = -1]$
177. ■■■□ $-\frac{x-4}{20} + \frac{5x-1}{10} = \frac{x}{5} + \frac{1}{2} - \frac{2(2x-2)}{5}$ $[x = 8/7]$

$$178. \blacksquare\blacksquare\blacksquare \quad \frac{2(x-2)}{3} - \frac{3(x-4)}{2} + \frac{1}{2}x = \frac{3}{4}x + \frac{1}{3} \quad [x = 4]$$

$$179. \blacksquare\blacksquare\blacksquare \quad \frac{2(x+5)}{2} - \frac{2x-6}{3} = \frac{2x+10}{2} - \frac{2(x-3)}{3} \quad [\text{indeterminata}]$$

$$180. \blacksquare\blacksquare\blacksquare \quad \frac{2(x-2)}{5} - \frac{1}{2}x + \frac{3}{4}x = \frac{3(1+x)}{10} - \frac{1}{20} \quad [x = 3]$$

4. Equazioni con termini frazionari e parentesi quadre

Parte Base 7. Risolvi le seguenti equazioni con termini frazionari e parentesi quadre:

$$181. \blacksquare\blacksquare\blacksquare \quad \frac{2[x-3(x-1)]}{5} = \frac{x}{2} - \frac{1}{10} \quad [1]$$

$$182. \blacksquare\blacksquare\blacksquare \quad 3 \left[\frac{1}{2}x - (x-1) \right] = -\frac{1}{4}x + \frac{5}{2} \quad \left[\frac{2}{5} \right]$$

$$183. \blacksquare\blacksquare\blacksquare \quad \frac{x-1}{2} - 2 \left[\frac{2(x+1)}{3} - \frac{x}{2} \right] = \frac{1}{6} \quad [12]$$

$$184. \blacksquare\blacksquare\blacksquare \quad \frac{2[x-(2x+1)]}{3} - \frac{x}{2} = \frac{3x-1}{6} \quad \left[-\frac{3}{10} \right]$$

$$185. \blacksquare\blacksquare\blacksquare \quad 2 \left[\frac{3(x-1)}{4} + \frac{1}{2}x \right] - 1 = \frac{x+1}{2} \quad \left[\frac{3}{2} \right]$$

$$186. \blacksquare\blacksquare\blacksquare \quad \frac{4x-1}{2} - \frac{2[2(x-2)-(x+1)]}{2} = \frac{x}{2} - \frac{x}{5} + \frac{3}{10} \quad [-6]$$

$$187. \blacksquare\blacksquare\blacksquare \quad -1 - 2 \left[\frac{3(x-1)}{4} + \frac{1}{2}x \right] - \frac{1}{2} = \frac{x+2}{3} - \frac{2}{3} \quad [0]$$

$$188. \blacksquare\blacksquare\blacksquare \quad 2 \left[\frac{-2(2x+1)}{2} + \frac{1}{2}x - 1 \right] = -3(x-1) - 4 \quad [\text{impossibile}]$$

$$189. \blacksquare\blacksquare\blacksquare \quad 5 \left[\frac{2(x-2)}{3} \right] - 3 \left[\frac{3(x-1)}{2} \right] = 2 \left(\frac{5}{2}x + \frac{1}{4}x \right) + \frac{9}{2} \quad [-1]$$

$$190. \blacksquare\blacksquare\blacksquare \quad 3 \left[2 \left(\frac{1}{2} - x \right) \right] + \frac{1}{2}x - \frac{1}{2} \left(x - \frac{2}{3} \right) = -6x + \frac{10}{3} \quad [\text{indeterminata}]$$

$$191. \blacksquare\blacksquare\blacksquare \quad \frac{-2[2(x-1)-(x+2)]}{5} + \frac{-3[3(x+1)+(x-2)]}{10} = -\frac{3}{10} \quad [1]$$

$$192. \blacksquare\blacksquare\blacksquare \quad \frac{3}{2}x + 1 - 2 \left[\left(\frac{x-2}{2} - \frac{1}{2} \right) - \frac{1}{2} \right] = \frac{5}{2}x + \frac{2}{3} + \frac{1}{3} \quad [2]$$

$$193. \blacksquare\blacksquare\blacksquare \quad 2 \left(\frac{4}{5}x + \frac{1}{2} \right) - 3 \left[2 \left(\frac{2x-1}{2} \right) + \frac{1}{3}x \right] = \frac{3}{2}x + \frac{1}{2} + \frac{x}{10} \quad \left[\frac{1}{2} \right]$$

$$194. \blacksquare\blacksquare\blacksquare \quad -3 \left[\frac{2x-3}{2} + \left(\frac{x}{3} - \frac{1}{2} \right) (-2) \right] = \frac{1}{2} \left[\frac{2x-1}{3} + 2 \left(\frac{1}{2}x - 1 \right) \right] - 1 \quad [2]$$

$$195. \blacksquare\blacksquare\blacksquare \quad \frac{-5(x+2)}{3} + \frac{2}{3}x = 2 \left[\frac{-2(2x+1)}{3} + \frac{1}{2}x - 1 \right] - \frac{2}{3} \quad [-1]$$

$$196. \blacksquare\blacksquare\blacksquare \quad \left[\frac{-2(x-3)}{7} \right] - \frac{-3(x+3)}{14} - \frac{1}{7} = \frac{5x}{7} - \left[\frac{-2(x-4)}{14} + \frac{x}{7} \right] \quad [1]$$

$$197. \blacksquare\blacksquare\blacksquare \quad \left[\frac{x-2}{15} - \frac{x+2}{15} \right] - \frac{-x+2}{2} = \frac{-x}{5} + 2 \left[\frac{5-x}{6} - \frac{1}{2}x \right] + \frac{5}{3} \quad [2]$$

$$198. \blacksquare\blacksquare\blacksquare \quad \left[\frac{-3(5-x)}{4} \right] - \frac{2-x}{5} + \frac{x}{2} = -3 \left[\frac{-(2x+4)}{10} + \frac{1}{2}x \right] + \frac{9}{20} \quad [-2]$$

$$199. \blacksquare\blacksquare\blacksquare \quad \frac{4x+3}{2} - \frac{-2[-2(x+3)]}{5} = \frac{2}{3}x - \frac{-(5-x)}{5} + \frac{3}{10} \quad [3]$$

$$200. \blacksquare\blacksquare\blacksquare \quad \left[\frac{-2(x+1)}{3} \right] - \frac{x-1}{2} = -2 \left[2 \left(\frac{x+1}{3} \right) + \frac{1}{2}x \right] \quad [-1]$$

5. Equazioni di secondo grado riconducibili al primo

Parte Base 8. Svolgi i calcoli e riduci le seguenti equazioni al primo grado eliminando i termini di grado superiore:

$$201. \blacksquare\blacksquare\square \quad 2x(x-3) + 5x = x(2x+1) + 4x - 6 \quad [1]$$

$$202. \blacksquare\blacksquare\square \quad (x+2)(x-2) = x(x-1) \quad [4]$$

$$203. \blacksquare\blacksquare\square \quad (x+4)^2 = x(9+x) \quad [16]$$

$$204. \blacksquare\blacksquare\blacksquare \quad (3x-2)^2 + (2x+3)^2 = 13(x^2-1) \quad [\text{impossibile}]$$

$$205. \blacksquare\blacksquare\blacksquare \quad x(x+1) + x^2 - 2x = x(x-1) + (x-1)^2 \quad \left[\frac{1}{2}\right]$$

$$206. \blacksquare\blacksquare\square \quad (x-1)^2 = x^2 - 3x + 5 \quad [4]$$

$$207. \blacksquare\blacksquare\square \quad (x+2)(x-2) - x^2 = x - 6 \quad [2]$$

$$208. \blacksquare\blacksquare\square \quad 2x(x+3) = (x+1)^2 + x^2 + 1 \quad \left[\frac{1}{2}\right]$$

$$209. \blacksquare\blacksquare\square \quad (2x-1)^2 = 4x(x-3) + 7 \quad \left[\frac{3}{4}\right]$$

$$210. \blacksquare\blacksquare\square \quad x^2 - (x-4)(x+4) = 2x \quad [8]$$

$$211. \blacksquare\blacksquare\blacksquare \quad (x+3)^2 - (x+1)^2 = 4x \quad [\text{impossibile}]$$

$$212. \blacksquare\blacksquare\blacksquare \quad (x-2)^2 + x(x+4) = 2x^2 + 4 \quad [\text{indeterminata}]$$

$$213. \blacksquare\blacksquare\blacksquare \quad (3x+1)(3x-1) = 9x^2 - x \quad [1]$$

$$214. \blacksquare\blacksquare\blacksquare \quad (x+1)^2 + 2x = (x+2)^2 - 3 \quad [\text{indeterminata}]$$

$$215. \blacksquare\blacksquare\blacksquare \quad 2(x-1)^2 = 2x^2 - x + 5 \quad [-1]$$

$$216. \blacksquare\blacksquare\square \quad (x+5)^2 - x^2 = 25 \quad [x=0]$$

$$217. \blacksquare\blacksquare\square \quad (2x-1)(2x+1) - 4x^2 = x + 3 \quad [x=-4]$$

$$218. \blacksquare\blacksquare\square \quad x(x+2) = (x-1)(x+1) + 5 \quad [x=2]$$

$$219. \blacksquare\blacksquare\square \quad (x-3)^2 = x^2 + 9 \quad [x=0]$$

$$220. \blacksquare\blacksquare\square \quad 3x(x-1) = 3x^2 - 12 \quad [x=4]$$

$$221. \blacksquare\blacksquare\blacksquare \quad (x+1)^2 + (x-1)^2 = 2x^2 + 2x \quad [x=1]$$

$$222. \blacksquare\blacksquare\blacksquare \quad (x+4)(x-4) = (x-2)^2 \quad [x=5]$$

223. ■■■■ $x^2 - 5x = (x - 5)^2 - 25$ [$x = 0$]

224. ■■■■ $(2x + 3)^2 = 4x^2 + 12x + 10$ [impossibile]

225. ■■■■ $x^2 - (x - 1)^2 = 2x - 1$ [indeterminata]

Parte Base 9.

226. ■■■□ $\frac{(x+1)^2}{2} - \frac{x^2}{2} = 2$ [$x = 3/2$]

227. ■■■□ $\frac{(x-3)(x+3)}{6} - \frac{x^2}{6} = x$ [$x = -3/2$]

228. ■■■□ $\frac{(2x-1)^2}{4} - x^2 = 2$ [$x = -7/4$]

229. ■■■□ $\frac{x(x+2)}{2} - \frac{(x+1)^2}{2} = 1$ [impossibile]

230. ■■■□ $\frac{(x+2)^2}{4} - \frac{x^2}{4} = x + 1$ [indeterminata]

231. ■■■■ $\frac{(x+4)(x-4)}{8} - \frac{x^2}{8} = x$ [$x = -2$]

232. ■■■■ $\frac{(3x-1)^2}{9} - x^2 = x$ [$x = 1/15$]

233. ■■■■ $\frac{x^2-1}{2} - \frac{(x-1)^2}{2} = 1$ [$x = 2$]

234. ■■■■ $\frac{(x+3)^2}{3} - \frac{x^2}{3} = 2x$ [impossibile]

235. ■■■■ $\frac{(x-2)^2}{4} - \frac{x^2-4}{4} = x$ [$x = 1$]

236. ■■■■ $(x - 3)^2 - (x + 1)(x - 1) = 2$ [$x = 4/3$]

237. ■■■■ $(2x + 1)^2 - 4x(x - 3) = 1$ [$x = 0$]

238. ■■■■ $(x + 2)^2 + (x - 2)^2 = 2x^2 - 8x$ [$x = -1$]

239. ■■■■ $(3x - 1)^2 - 9x(x + 2) = 5$ [$x = -1/6$]

240. ■■■■ $\frac{(x+1)^2}{2} - \frac{(x-1)^2}{2} = 3x - 2$ [$x = 2$]

241. ■■■■ $(x + 3)(x - 3) - (x - 3)^2 = 6x - 18$ [indeterminata]

242. ■■■■ $2(x - 1)^2 - (x - 2)(x + 2) = x^2 + 5$ [$x = 1/4$]

243. ■■■■ $(x + 1)^2 + (x + 2)^2 = 2x^2 + 6x + 9$ [impossibile]

244. ■■■■ $\frac{(2x+1)^2}{4} - (x - 1)(x + 1) = x + \frac{5}{4}$ [indeterminata]

245. ■■■■ $3(x - 2)^2 - (x + 1)(x - 1) = 2x^2 - 10$ [$x = 23/12$]

246. ■■■■ $3(x - 1)^2 - 2(x + 2)^2 = (x - 4)(x + 4) - 10x$ [$x = 11/4$]

247. ■■■■ $(2x + 3)^2 - (x - 1)^2 = 3(x + 2)(x - 2) + 10x$ [$x = -5$]

248. ■■■■ $(x + 5)^2 - x^2 = 10x + 24$ [impossibile]

249. ■■■■ $(3x - 1)^2 - 9x^2 = -6x + 2$ [impossibile]
250. ■■■■ $(x + 1)^2 - x^2 = 4x - 5$ $[x = 3]$
251. ■■■■ $(x + 3)^2 - (x - 1)^2 = 8(x + 1)$ [indeterminata]
252. ■■■■ $(x - 4)^2 + (x + 4)^2 = 2x^2 + 32$ [indeterminata]
253. ■■■■ $(x + 1)^2 - (x - 2)^2 = 3(2x - 1)$ [indeterminata]
254. ■■■■ $(x - 5)(x + 5) - (x - 1)^2 = 2x - 26$ [indeterminata]
255. ■■■■ $(3x + 1)^2 - (3x - 1)^2 = 8x + 4$ $[x = 1]$

6. Equazioni di primo grado: Sfide e Semplificazioni

Parte Avanzata 1. Risolvi le seguenti equazioni di livello avanzato, prestando attenzione ai prodotti notevoli e alle semplificazioni dei termini di grado superiore:

256. ■■■■ $(x - 2)^2 - 8 + x = x(x - 6)$ $[x = 4/3]$
257. ■■■■ $(2x + 1)(x - 3) - 2x = 2(x - 1)^2 + 1$ $[x = -2]$
258. ■■■■ $6 - 2x - (2 - x^2) = 1 + (x - 3)^2$ $[x = 3/2]$
259. ■■■■ $x(x^2 - 2) - (x + 1)^3 = 3x(1 - x) - 2$ $[x = 1/8]$
260. ■■■■ $3\left(\frac{1}{2}x - 1\right) - (1 + x) + \frac{1}{3}\left(2x + \frac{1}{2}\right) = \frac{1}{2}x + 1$ $[x = 29/4]$
261. ■■■■ $\frac{1-2x}{2} - \frac{(1-4x)(1-2x)}{6} = \frac{5}{6} - \frac{(2x-1)^2}{3}$ $[-\frac{1}{8}]$
262. ■■■■ $\frac{5}{3} + x - \frac{x+2}{3} + \left(x - \frac{3}{2}\right)\left(x + \frac{3}{2}\right) = (x + 1)^2 - \frac{9}{4}$ $[0]$
263. ■■■■ $\frac{1+x^2}{5} - \frac{1-x}{4} - \frac{(x-1)^2}{20} = \frac{x}{5} + \frac{3}{2} - 1$ $[\frac{11}{3}]$
264. ■■■■ $\frac{2}{3}x + \frac{(3-2x)^2}{18} - \frac{(2x-1)(2x+1)}{18} = \frac{x-5}{3} + \frac{x+4}{6} - \frac{5}{9}x$ $[-28]$
265. ■■■■ $\frac{x}{10} + \frac{(2-3x)^2}{30} + \frac{x}{10}(1 - x) + \frac{2}{15}(1 + 5x) = \frac{x}{5}(3 + x) - \frac{x-2}{6}$ $[2]$
266. ■■■■ $\frac{(2x^2+3)-x(2x-1)}{2} + \frac{5(x-1)(x+1)-5(x+1)^2}{15} = x + 2 - \frac{4}{3}x$ $[7]$
267. ■■■■ $\frac{x}{6} + \left[\left(3x - \frac{1}{3}\right)^2 - \left(3x - \frac{1}{3}\right)\left(3x + \frac{1}{3}\right)\right] + \frac{x}{3} = \frac{3x-1}{6} - \frac{7}{18}$ [impossibile]
268. ■■■■ $\left(x - \frac{1}{4}\right)^2 - \left(2x + \frac{1}{3}\right)\left(2x - \frac{1}{3}\right) + 5x\left(x - \frac{1}{4}\right) - \frac{1}{144} = \left(x + \frac{1}{3}\right)\left(2x - \frac{5}{2}\right) + \frac{2}{3}$ $[-4]$
269. ■■■■ $\frac{13}{48} + \frac{x}{2} - \frac{2x+1}{6} = 1 - \left(\frac{1}{4} - x\right)\left(x + \frac{1}{4}\right) - \left(x + \frac{1}{2}\right)^2$ $[\frac{1}{2}]$
270. ■■■■ $\frac{(2x+2)(1-x)}{3} - \frac{2(1-2x)^2-6(x-1)^2}{2} = -3 + \frac{1}{3}(17 - 5x^2) - 2x$ [indeterminata]
271. ■■■■ $\frac{2[(x-4)(2x-1)+7]}{3} - \left(x - \frac{1}{4}\right)\left(\frac{1}{4} + x\right) = \frac{1}{3}x^2 + \frac{22}{3} - x + \frac{17}{16}$ $[-\frac{1}{5}]$

272. ■■■■ $[(2 - \frac{1}{2}x)(-2 - \frac{1}{2}x) + (x - 2)^2] \cdot (-\frac{4}{5}) - \frac{1}{5}x = 1 - x(x - 5)$ $[-\frac{1}{2}]$
273. ■■■■ $\frac{4}{5}(2^{-3}x + 4^{-2}) - \frac{1}{5}[2x - (-2)^{-3}] = \frac{5^{-1}}{2^{-3}}$ $[-\frac{21}{4}]$
274. ■■■■ $(x - \frac{1}{3})^3 - (\frac{2}{5}x - 1)(2 - x) - x(\frac{2}{5}x + 3) = x^2(x - 1) - \frac{1}{3}(2 - x) - \frac{1}{27}$ $[\frac{5}{9}]$
275. ■■■■ $\frac{2}{3}(x - 7)^2 + 5(x - \frac{1}{3}) + \frac{4}{6} = \frac{2}{3}(x - 1)(x + 1) + \frac{129}{6}$ $[\frac{5}{2}]$
276. ■■■■ $\frac{1}{2}(x - 2) - (\frac{1}{2}x + 3) = \frac{1}{2}(x - \frac{7}{2}) - \frac{3}{4}(2x + 1) + \frac{3}{4}x$ $[6]$
277. ■■■■ $\frac{1}{3} - [\frac{x}{3} - \frac{1}{3}(2 + x) - \frac{1}{3}(1 - 3x)] = (2 - x) - \frac{1}{3}(x - 2)$ $[4]$
278. ■■■■ $0, \bar{3}x = \frac{2}{3}(x - \frac{1}{0,6}) + 1$ $[0]$
279. ■■■■ $\frac{1}{5}x(1 - \frac{1}{3}) + \frac{1}{10}(1 - x) - \frac{1}{6} = \frac{1}{6}(1 + \frac{1}{5} - \frac{7}{5})$ $[1]$
280. ■■■■ $\frac{x}{4} - \frac{1}{2}(\frac{1}{2}x + \frac{x-3}{2} - \frac{x+2}{4}) = \frac{1}{12}(1 - 3x) - \frac{11}{24}$ $[-5]$
281. ■■■■ $\frac{(3-2x)(3x-2)}{6} = \frac{-3x^2-7}{3} - \frac{3}{2}(4 - 3x) - \frac{2(x-10)}{6}$ $[2]$
282. ■■■■ $\frac{2x-1}{3}(x - \frac{1}{3}) - \frac{1}{3}[x^2 + x(x - \frac{1}{4})] = \frac{1}{4}(x + \frac{2}{3})$ $[-\frac{1}{13}]$
283. ■■■■ $\frac{1}{8}[(x - 2)(x - 3)] - \frac{15}{4} = \frac{1}{4}[(x^2 - 6x) - \frac{1}{2}x(x + 1)] - 1$ $[2]$
284. ■■■■ $\frac{2}{5}(x - 1)(2x - 3) + \frac{x-1}{7} - \frac{1}{5}(x - 3)(2x - 3) = \frac{2}{5}x^2 + \frac{1}{7}$ $[-\frac{31}{2}]$
285. ■■■■ $\frac{3x+2}{5} + \frac{1}{2}x - \frac{1}{5}[x + 2 - \frac{1}{2}(x - \frac{2}{3})] = \frac{3x+1}{10} + \frac{2}{3}x$ $[5]$
286. ■■■■ $\frac{2x-1}{3} - \frac{(x+1)^2}{2} = \frac{5}{6} - \frac{x(x-2)}{2}$ $[-\frac{5}{4}]$
287. ■■■■ $(x - 2)^3 - x(x - 3)^2 = 2(x - 4) + x$ [indeterminata]
288. ■■■■ $\frac{(2x+1)(2x-1)}{4} - \frac{1}{3}(x + 2)^2 = x^2 - \frac{1}{3}x(x + 4) - \frac{1}{12}$ [impossibile]
289. ■■■■ $\frac{x}{2} + \frac{(x-1)^2}{3} = \frac{x^2+x}{3} - \frac{1}{6}(x - 2)$ $[0]$
290. ■■■■ $(x + 1)^3 - x^3 - 3x(x - 2) = 8x + 3$ $[2]$
291. ■■■■ $\frac{(x-1)^3 - x^2(x-3)}{3} - \frac{(2x+1)^2}{4} = 2x - x^2$ $[-\frac{7}{24}]$
292. ■■■■ $\frac{(x+2)^3 - (x-2)^3}{4} - 3x^2 = \frac{3x+4}{4}$ $[4]$
293. ■■■■ $(x - \frac{1}{2})(x + \frac{1}{2}) - (x - \frac{1}{3})^2 = \frac{x}{3}$ $[\frac{13}{12}]$
294. ■■■■ $\frac{x+1}{2} - [\frac{2x-1}{3} - (\frac{x-1}{4} - \frac{2-x}{6})] = \frac{3x+5}{12}$ [impossibile]
295. ■■■■ $\frac{(2x-1)^3}{8} - x^2(x - \frac{3}{2}) = \frac{x}{2} + 1$ $[\frac{9}{2}]$